

REMARKS

Claims 1-21 are presented for further examination. Claims 1-6, 8, 11-15, and 17-20 have been amended.

In the Office Action mailed October 18, 2005, the Examiner rejected claims 1-2, 4-6, and 10-19 under 35 U.S.C. § 103(a) as obvious over Nelson (of record) in view of Mardirossian (of record) and further in view of newly cited U.S. Patent No. 4,835,537 ("Manion"). Claim 3 was rejected as obvious over Nelson in view of Mardirossian, Manion, and McBain (of record). Claim 7 was rejected as obvious over Nelson in view of Mardirossian, Manion, and Murray et al. (of record). Claims 8-9 were rejected as indefinite under 35 U.S.C. § 112, second paragraph, because the "ground-based object" has no antecedent basis. Claim 8 has been amended to recite "a" ground-based object, thus overcoming this rejection.

Applicant respectfully disagrees with the bases for the rejections over the cited references and requests further consideration and examination of the claims.

Claim 1 is directed to a system for protecting aircraft operation at all times while an aircraft is in service, the aircraft having a pilot-operated control system to operate aircraft flight and taxi controls and an on-board autopilot coupled to the control system to automatically operate the aircraft flight and taxi controls. Claim 1 recites the system for protecting aircraft as comprising an anti-crash system on the aircraft that automatically and without human intervention transmits commands to prevent the aircraft from crashing into the ground and objects on the ground and in the air, and an auto-controlling and piloting system on the aircraft that receives the commands from the anti-crash system and is configured to prevent control by the pilot-operated control system and the on-board autopilot, the auto-controlling and piloting system overriding the pilot-operated control system and the autopilot to control movement of the aircraft on the ground and in the air. Claim 1 also recites a monitoring device system communicating with the anti-crash system and a secondary aircraft-controller system on board

the aircraft and coupled to the auto-controlling and piloting system for controlling the aircraft flight and taxi controls independent of the pilot-operated controls and the on-board autopilot.

Applicant adopts and incorporates herein the arguments previously submitted in the amendment filed on June 29, 2005, with respect to the references of record. In this most recent Office Action, the Examiner has relied upon a combination of Nelson, Mardirossian, and Manion to reject claim 1. Applicant has amended claim 1 to more particularly recite the features and advantages of the present invention, which distinguish over the combination of references relied upon by the Examiner. As the Examiner recognizes, the Nelson reference is not automatically activated. Rather, a panic button is activated by the flight crew in case of a hijacking or override signals are transmitted from a remote guidance facility. Nowhere does Nelson teach or suggest an anti-crash system on the aircraft coupled to a monitoring device to monitor the aircraft path of travel, either on the ground or in the air, to automatically prevent collisions with the ground and objects on the ground and in the air. Nowhere does Nelson teach or suggest an auto-controlling and piloting system that receives commands from the anti-crash system and that is coupled to a secondary aircraft controller system on board the aircraft for controlling the aircraft flight and taxi controls independent of the pilot-operated controls and the on-board autopilot.

The Examiner has relied upon Mardirossian for suggesting automatic control of an aircraft from a ground facility (29) in order prevent crashing into undesired areas. However, Mardirossian is directed to a control system for an air vehicle in which a controller automatically takes control of the air vehicle by causing the on-board autopilot to take control and land the air vehicle at a selected airport or runway when the control system detects that the air vehicle is about to hit a designated structure, such as a high-rise building, monument of national and/or local importance, government building, or the like (see Mardirossian, col. 1, lines 25-30). Nowhere does Mardirossian teach or suggest an anti-crash system coupled to a monitoring system on board the aircraft to prevent crashing into the ground and objects on the ground and in the air. Nowhere does Mardirossian teach or suggest an auto-controlling and piloting system coupled to a secondary aircraft controller system on board the aircraft that overrides pilot-

operated controls and the on-board autopilot to control the aircraft flight and taxi controls independent of the pilot-operated controls and the on-board autopilot. Thus, both Mardirossian and Nelson lack these claimed features of the present invention, among others. Moreover, Manion, which the Examiner relies upon for teaching the desirability of providing collision protection for an aircraft at all times, including against obstacles in the air or on the ground, Manion does not teach or suggest automatic, *i.e.*, in this case without human intervention, control of the aircraft via a secondary aircraft controller system and an auto-controlling and piloting system. Rather, Manion is merely a warning system that provides notice to the pilot of potential obstructions and the pilot must respond.

There is no suggestion in any of these three references for combining them together. Rather, Manion is directed to a warning system only and specifically teaches that the pilot maintains control of the aircraft at all times. In contrast, Mardirossian describes a ground-based controller that sends signals to the autopilot of the aircraft to avoid crashing into designated areas, this in response to potential hijacking situations. Clearly there is no teaching or suggestion of combining these two references together, much less combining these references with Nelson, which is an anti-hijacking system that requires human intervention to activate it. If anything, only Manion and Nelson would be compatible because they both place ultimate responsibility on the flight crew to respond to emergency situations, and this is inapposite to the present invention, which utilizes fully automatic equipment and procedures.

With respect to claim 1, even if one were motivated to make the combination suggested by the Examiner, it would still fall short of the present claimed invention. In particular, the combination does not teach or suggest a secondary aircraft controller system on board the aircraft that, in response to the auto-controlling and piloting system, controls the aircraft flight and taxi controls independent of the pilot-operated controls and the on-board autopilot. None of these references, taken alone or together teach or suggest an auto-controlling and piloting system separate and apart from the on-board autopilot that receives commands from the anti-crash system to control movement of the aircraft on the ground and in the air while overriding the pilot-operated control system and the autopilot. And while Manion teaches a

ground-based controller that detects possible collisions between the aircraft and other objects, nowhere does Manion, taken alone or in combination with Nelson and Mardirossian, teach or suggest an anti-crash system on the aircraft coupled to a monitoring device system that automatically and without human intervention transmits commands to prevent the aircraft from crashing into the ground and objects on the ground and in the air.

In view of the foregoing, applicant respectfully submits that claim 1 is clearly allowable over the references cited and applied by the Examiner.

Claim 2, which depends from claim 1, recites an authorities security aircraft flight equipment system communicating with the anti-crash system and the auto-controlling and piloting system and the monitoring system. Nowhere do Manion, Mardirossian, and Nelson, taken alone or in any combination thereof, teach or suggest such a system in combination with the system of claim 1.

Claims 3-10, all of which depend ultimately from claim 1, are allowable for the features recited therein as well as for the reasons why claim 1 is allowable.

Claim 11 is directed to an aircraft protection system for an aircraft having a control system that operates aircraft flight and taxi controls and an onboard autopilot coupled to the control system to automatically operate the aircraft flight and taxi controls. The system is recited as including an on-board monitoring system to transmit communication signals responsive to monitoring the aircraft, an anti-crash control system on board the aircraft coupled to the monitoring system and responsive to the communication signals to automatically and without human intervention transmit commands to prevent the aircraft from crashing into any object, an auto-controlling and piloting system on board the aircraft that receives the commands from the anti-crash system and prevents control of the aircraft by the on-board autopilot, the auto-controlling and piloting system overriding the autopilot to control movement of the aircraft on the ground and in the air, a secondary aircraft controller system on board the aircraft to control the aircraft flight and taxi controls in response to the auto-controlling and piloting system, and an authorities security aircraft flight equipment computer remote from the aircraft

that communicates with the anti-crash system and the auto-controlling and piloting system and the monitoring system.

As discussed above with respect to claim 1, nowhere do Nelson, Mardirossian, and Manion, taken alone or in any combination thereof, teach or suggest the features recited in claim 11. For example, the combination of these references does not teach or suggest a secondary aircraft controller system on board the aircraft to control the aircraft flight and taxi controls in response to an auto-controlling and piloting system that overrides the existing autopilot in response to communication signals from an onboard anti-crash control system that is coupled to an on-board monitoring system. In addition, the combination of these references does not teach or suggest the inclusion of an authorities security aircraft flight equipment computer remote from the aircraft that communicates with the anti-crash system, the auto-controlling and piloting system, and the monitoring system. Applicant respectfully submits that claim 11, as well as dependent claims 12-16, are clearly allowable over the references cited and applied by the Examiner.

Claim 17 is directed to an aircraft flight management system that comprises an aircraft control and communication module configured to be coupled to an aircraft control system that is secondary to existing aircraft electronic flight controls and electronic engine controls. Nowhere does the combination of Nelson, Mardirossian, and Manion teach or suggest a secondary aircraft control system. All of these references rely upon existing aircraft electronic flight controls and electronic engine controls. Claim 17 further recites the module as including an anti-crash system that detects impending crashes with objects and sends an electronic command signal to an auto-controlling and piloting system that is adapted to receive electronic communication signals automatically generated from sensors in the aircraft and from ground-based and air-based facilities without any flight crew or other human intervention in the air or on the ground to override aircraft flight and engine control commands from a cockpit of the aircraft to prevent control by the on-board autopilot and to avoid collisions with the earth and other objects at all times while the aircraft is in service. Nowhere does the combination of Nelson, Mardirossian, and Manion teach or suggest an aircraft flight management system that has a

secondary aircraft control system coupled to an anti-crash system and auto-controlling and piloting system to automatically and without any flight crew or other human intervention in the air or on the ground to override aircraft flight and engine controls from a cockpit of the aircraft to prevent control by the on-board autopilot and to avoid collisions with the earth and other objects at all times while the aircraft is in service. Applicant respectfully submits claim 17 is allowable over these references.

Claim 18 is directed to an aircraft flight management system that comprises a secondary control system for interfacing with aircraft flight control systems to enable automatic override of existing aircraft control systems upon receipt of automatically generated air-based and ground-based transmission signals in response to commands from an anti-crash system, which commands and transmission signals are generated without any human intervention. Claim 18 recites the flight management system as being configured to prevent control by an on-board autopilot at all times while the aircraft is receiving the transmission signals. As discussed above, nowhere does the combination of Nelson, Mardirossian, and Manion teach a secondary control system for interfacing aircraft flight control systems to enable automatic override of existing control systems. Rather, all of these references describe using existing autopilots or pilot-operated controls to control the aircraft in potential crash situations. Moreover, none of these references taken alone or in any combination thereof suggest or teach using an anti-crash system that automatically operates without any human intervention to generate and receive commands and transmission signals to override the on-board autopilot at all times while the aircraft is receiving the transmission signals. In view of the foregoing, applicant respectfully submits that claim 18 is clearly allowable over the references cited and applied by the Examiner.

Claim 19 is directed to an aircraft management system for an aircraft having flight and taxi controls and an on-board autopilot coupled to the flight controls, the system including a monitoring system for automatically detecting when the aircraft is on a collision course with an object and automatically generating a detection signal when a collision course with an object or the ground is detected. Claim 19 further recites an anti-crash system coupled to the monitoring system for receiving the detection signal therefrom and coupled to the autopilot and coupled to

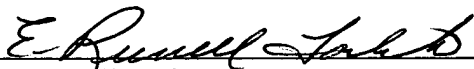
the flight and taxi controls via a secondary control system on the aircraft, the anti-crash system responsive to the detection signal to send commands to an auto-controlling and piloting system on board the aircraft to automatically bypass the autopilot and control the path of the aircraft without any human intervention to avoid a collision with the object or the ground, the anti-crash system configured to prevent control by the on-board autopilot when the anti-crash system is activated. Here again, none of the references cited by the Examiner, taken alone or in any combination thereof, teach or suggest an aircraft management system for an aircraft having flight and taxi controls that prevents control by the onboard autopilot and uses a secondary control system to control the flight and taxiing of the aircraft. In view of the foregoing, applicant respectfully submits that claim 19 is clearly allowable over the references cited and applied by the Examiner.

Applicant is submitting herewith a three-page fault tree analysis of the McBain, Mardirossian, Manion, and Nelson references relied upon by the Examiner. This fault tree analysis compares these references to the claimed invention, and in particular how each of the systems taught by these references would respond to situations that the present claimed invention is designed to respond in a manner that prevents collision with the ground or objects on the ground and in the air. This three-page reference is designed to be viewed as a single document with the McBain and Mardirossian fault tree analyses on the left, the Manion fault tree analysis in the center, and the Nelson fault tree analysis on the right. The numbers in certain portions of this document reference the claims prior to the current amendment. This fault tree analysis is provided to the Examiner to illustrate how these references, taken alone or in any combination thereof fail to prevent collisions in the manner provided by the present claimed invention.

Applicant respectfully requests a telephonic interview with the Examiner once the Examiner has had an opportunity to review the foregoing amendments, arguments, and fault tree analyses. Submitted herewith is an Applicant Initiated Interview Request Form requesting a telephonic interview with the Examiner.

In view of the foregoing, applicant respectfully submits that all of the claims in this application are now clearly in condition for allowance. Thus, early and favorable action allowing these claims and passing this case to issuance is respectfully solicited.

Respectfully submitted,
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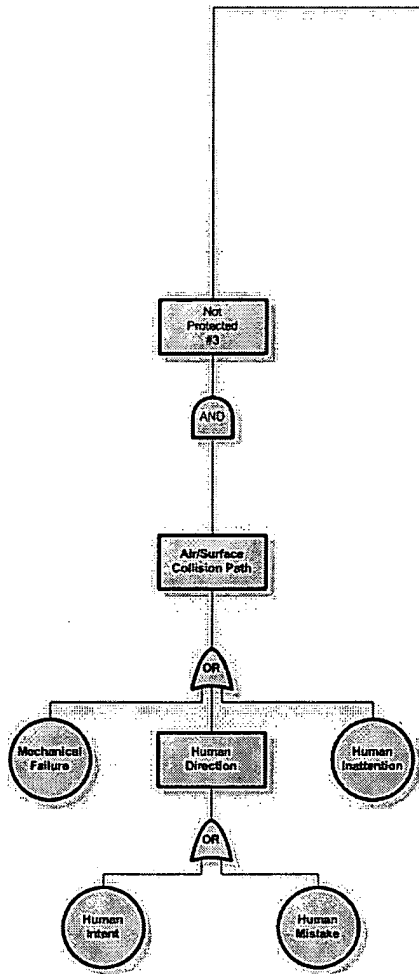
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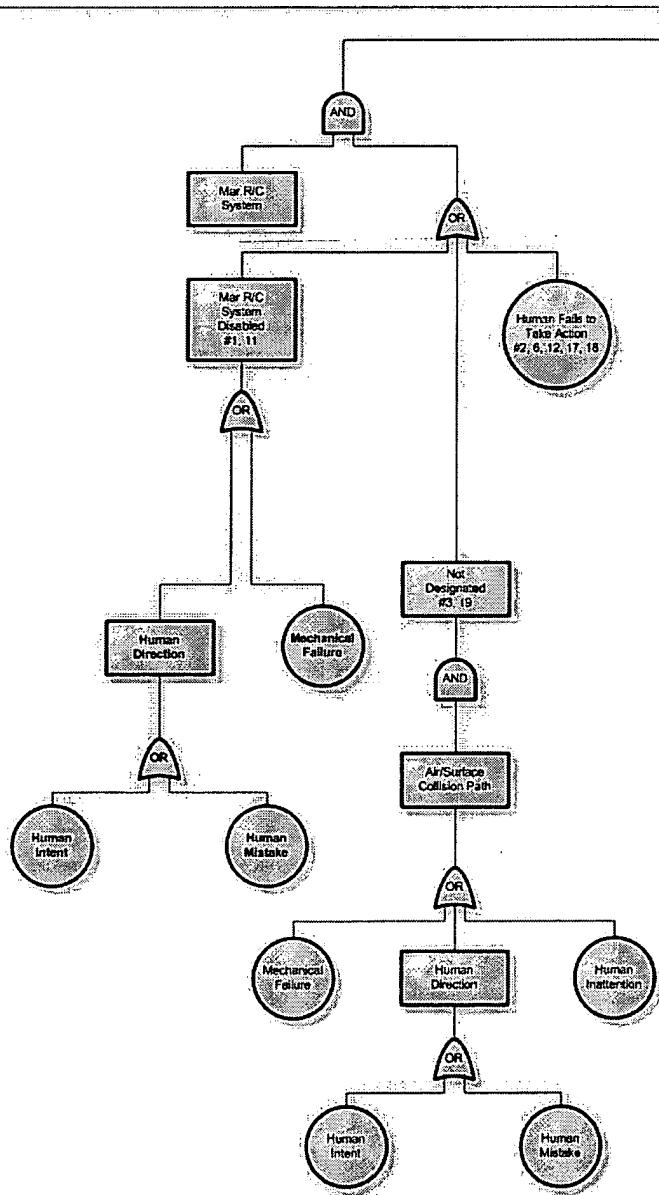
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Fault Tree Analyses
Applicant Initiated Interview Request Form

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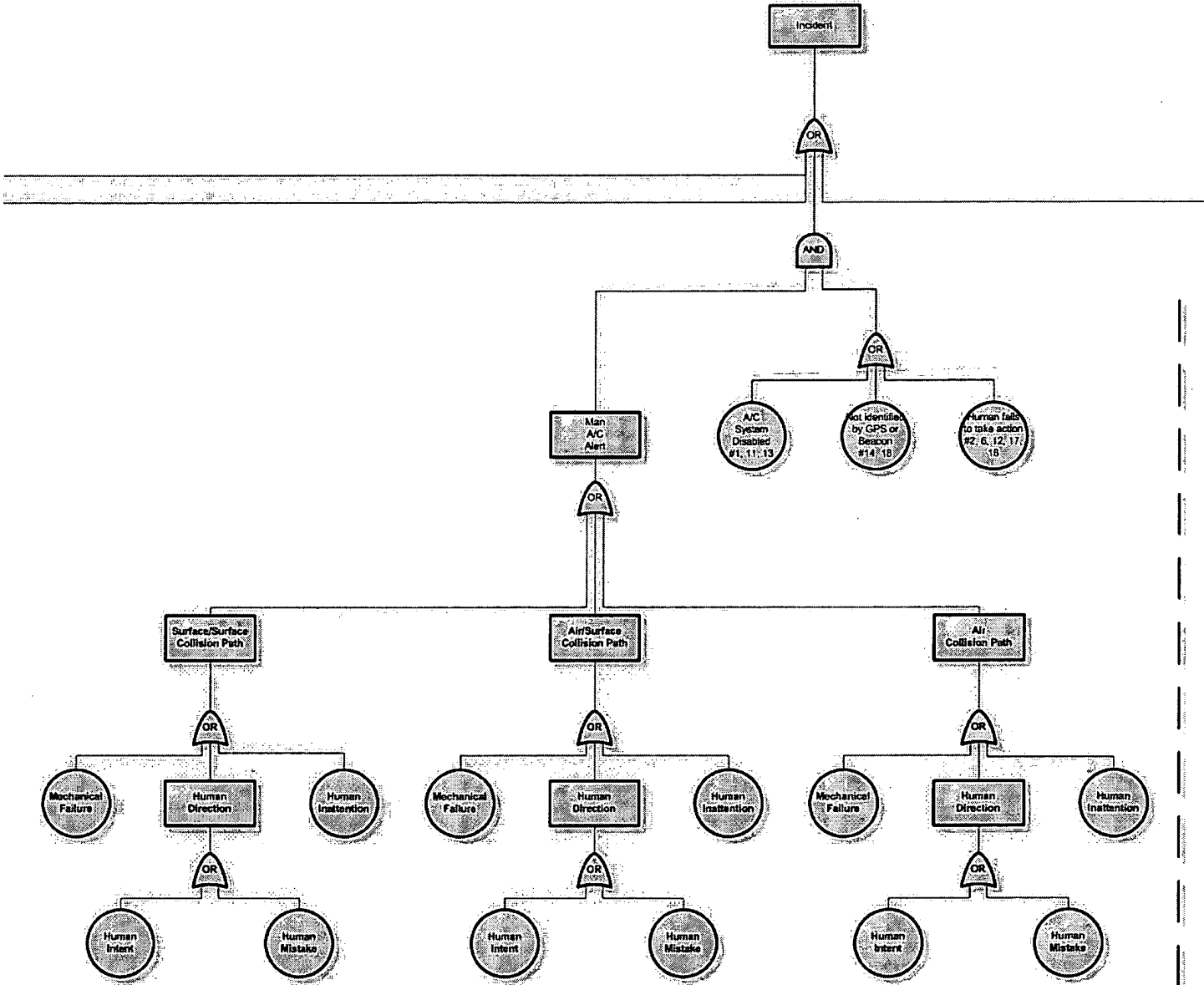
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McBain

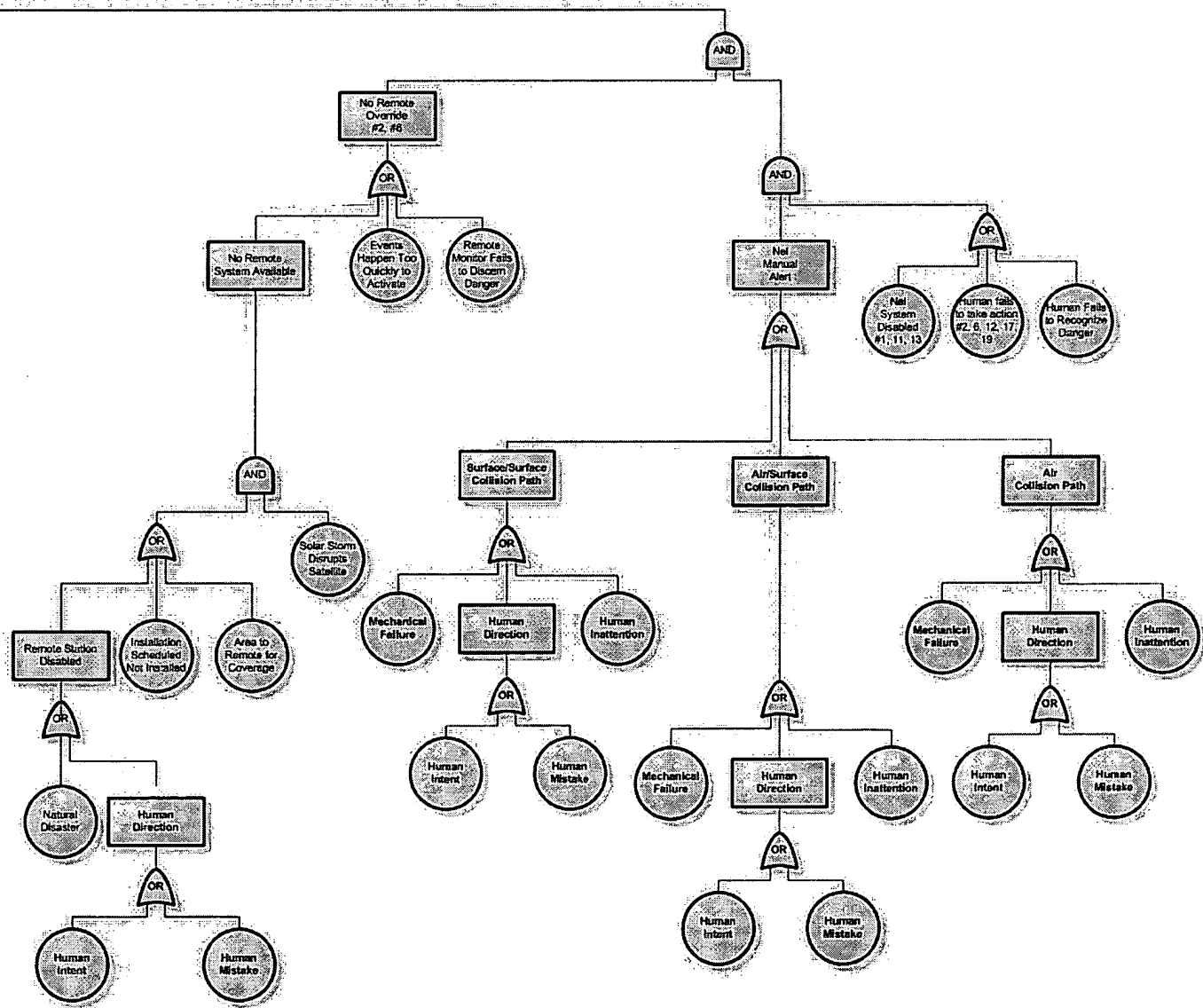


Mardirossian



Manion

Claims that are not unique to Boudrieau
10 - Nel and Mar provides for remote authorities
15 - Nel and Mar provides for remote authorities
16 - Nel and Mar provides for remote authorities



Nelson